Leading Teachers Into Technology

By Lois Crawley
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"I've been teaching for seventeen years, and my methods work great. Why change now?"
"My students score well on the core tests. If it isn't broken don't fix it."
"The District has no right to force me to use this computer. They can put it in my room, but they can't make me use it."
"There isn't anything the computer can "teach" that I can't teach without it."

These are just some of the comments often made by teachers who are reluctant to embrace technology as a teaching and learning tool. What is the cause of their reluctance? Why do some teachers have such enthusiasm that they dive head first into the technology tide, while others are so set on using the "same old" methods of teaching that they won't even get their feet wet? Are they really anti-technology, or is there some other underlying cause for their hesitancy and skepticism? How can reluctant teachers be lead into technology? It is the purpose of this paper to shed some light on these issues and also provide some ideas for possible solutions to this dilemma.

Importance of Technology in the Classroom

It's necessary to establish whether or not it is important for teachers to use technology in their classrooms. Yes, many methods of instruction have been used successfully for years. However, technology is a valuable tool that should not be overlooked just because it is new and sometimes difficult to get used to. Computers by themselves don't really have much educational value, although they do carry a hefty price tag. It is through the imagination and expertise of the users that computers and other technical tools become extremely valuable.

We are living in an information age where the Internet can bring the world into the nation's classrooms. Using technology in the classroom can "prepare children for global citizenship and develop in them the skills, awareness, and determination to become responsible stewards of the earth." (Armbruster).

In his book *Growing Up Digital*, Don Tapscott discusses the fact that in the "Net Generation," children are "beginning to process information and learn differently than the boomers before them." He maintains that the economy and society that children today are growing up into is very different than that of the boomers. Therefore, since the destination is different, the route we take to get there should be different as well. (Tapscott p. 127).

Historically, education was oriented towards *broadcast learning*, where a teacher is an expert who has information to broadcast to students. The teacher transmits the information and the student receives it

if they are "tuned-in ." Examples of broadcast media are lectures, textbooks, homework assignments, direct instruction, etc. We all recognize these as familiar strategies. These methods go back centuries and have their foundation in "authoritarian, top-down, teacher-centered approaches." Teachers have historically rejected the discovery model of learning. Due to large class sizes and limited resources, delivering education today still often follows the broadcast model. (Tapscott p. 129- 130)

To quote Don Tapscott, "People who oppose computers in the schools are like doctors who oppose the use of modern medicine." (Tapscott, p. 135) Technology is like modern medicine. It has great potential for increasing our quality of life, if it is not abused, and we understand how to use it. There are many reasons for using technology in the classroom. Four of these reasons include: First, when appropriately integrated into the curriculum, technology can improve student performance, motivation, collaboration and communication skills. Second, fluency with technology is almost a "requirement" for a productive life in the new economy and for effectively living in the digital age. Third, children become proficient with technology by using it to do other things. Wise teachers don't just teach children about computers, but use computers to help children learn. This will create fluency as a by-product of their learning. Fourth, discipline problems are diminished when kids are using computers. Bob Beatty is an education and technology specialist who is conducting a project in London to get 40,000 students wired. He reports, "It is strange, but there are never discipline problems when the kids are using their computers. The only problem is peeling them off the screen." This may be partly attributed to the ability of technology to "honor multiple forms of intelligence," as noted by John Seely Brown, a researcher for Xerox. He suggests that technology provides "a medium for each kid to be able to create and experience things that optimize how his brain is structured at the moment." (Tapscott, p. 160)

Technology can help teachers make the transition from broadcast learning to *interactive* learning. This is a shift to a more powerful and effective learning paradigm. Figure 1.1 outlines Don Tapscott's eight shifts of interactive learning.

Table 1.1

Broadcast Learning			Interactive Learning
	Linear, sequential/serial	→ Hypermedia learning	
	Instruction	→ Construction/discovery	
	Teacher-centered	→ Learner-centered	
	Absorbing materials	→ Learning how to learn	
	School learning	→ Lifelong learning	
	One-size-fits-all	→ Customized	
	School as "torture"	→ School as fun	
	Teacher as transmitter	→ Teacher as facilitator	

(Tapscott, p.143)

Where We Stand in Technology Now

The following is a "snapshot" of high-tech education in the United States as determined by Market Data Retrieval, Technology in Education, 1998 and reported by SIRS Knowledge Source in the article entitled, *High Tech High Grades*.

Number of PC's in U.S. public schools: 7.4 million
Classrooms with at least one computer: 75%
Ratio of students per computer: 6.3 to 1
Schools with Internet access: 85%
Classrooms with Internet access: 44%
Schools with local area networks: 78%
Schools using CD-ROM software: 97%
Schools offering 15+ hours of teacher technology training anually: 35%
Schools offering no teacher technology training: 36%

According to the National Center for Education Statistics, these figures were even better in 1999, where 95% of all public schools have Internet access, and 63% of all classrooms have access. The ratio of students per computer with Internet access improved from 12 to 1 in 1998 to 9 to 1 in 1999.

Reasons for Reluctance

We have determined that it is indeed important for teachers to use technology in their classrooms, and that technology is pouring into our nations schools. So why don't more teachers integrate technology effectively, if at all? Most teachers are skilled, motivated professionals who are dedicated to educating their students, however, many resist change. Teachers have learned the broadcast mode of pedagogy. In reality, a whole generation of teachers need to learn to use the new tools, approaches and skills that accompany new technologies. Many teachers are concerned about their role as the learning model changes from broadcast to interactive. They realize that they must change, for if they don't transform their classrooms and themselves, "they face even greater threats to their job security. Society will find other ways to deliver learning and bypass them." (Tapscott, p. 138) Making these changes will be difficult, not only because some teachers resist change, but because of the current atmosphere of cutbacks, low teacher morale, lack of time, increased workloads, and reduced training budgets.

Jamie McKenzie, in his new book, *How Teachers Learn Technology Best*, suggests that much of the technology professional development has been designed by technology enthusiasts with "little empathy for reluctants." He also maintains that "reluctants" have special needs, interests, and learning styles that must be addressed, however "little has been done to prepare reluctant technology users for the networked

computers flooding into their rooms." Some "reluctant" or "late adopters" have been given little support, few opportunities, and marginal equipment. (McKenzie). Because of this, it is estimated that less than 25% of our teachers have managed to integrate technology into regular classroom programs. (Office of Technology Assessment). Although Internet access has increased dramatically, "just seven percent of schools claim that the majority of their teachers are at an advanced skill level." (Market Data Retrieval). "Only twenty percent of teachers report feeling very well prepared to integrate educational technology into classroom instruction." (The CEO Forum). All of these indicators point to a lack of appropriate training, experience, support, and resources. Schools have "bought half a product – infrastructure without compelling curriculum value." They have ignored "legitimate curriculum questions" and "skimped on "professional development investments." (McKenzie). This leads some teachers to question the value of the new "toys."

Characteristics of Reluctant Teachers or "Late Adopters"

The term "Late Adopter" originated in the technology marketplace outside of schools. It was a way to differentiate between early and late buyers of technology. In the educational setting, a "Late Adopter" is a teacher who has not yet embraced new technologies or integrated them into their classroom. (McKenzie). According to Jamie McKenzie, there are two main characteristics of "Late Adopters." In summary:

1. **Late adopters want proof of results before they buy:**
    a. they expect a big difference in outcomes and performance
    b. they have little tolerance for change
    c. they are unwilling to give up time tested methods unless there is evidence of a big pay off

2. **Late adopters want a complete, finished product before they buy:**
    a. they expect a complete, user friendly package that is well supported
    b. they are pragmatists
    c. they are conservative and distrustful of change for change sake
    d. they have no patience for untested schemes or unproven technologies

Crossing the Chasm (Moore, 1991) describes a huge gap between early adopters and late adopters, and requires that special attention be paid to the vastly different needs, perspectives and demands of late adopters. His work is based on corporate customers, however his observations are also pertinent to the widening "chasm" in the educational world. (McKenzie).

Reaching Reluctant Teachers

Although it seems like reluctant teachers will never want to embrace technology, there are strategies that will increase the likelihood of this happening. Schools must be willing to invest time and resources to train reluctant teachers thoroughly. McKenzie suggests a commitment of 15 - 60 hours annually of "adult learning experiences tailored to special attitudes and preferences." I also believe that along with the personalized training, as well as adequate equipment, teachers need to be provided with "ready-prepared" resources that can be used to integrate technology into the curriculum. These resources may consist of multimedia presentations that demonstrate curriculum concepts, Web Quests, completely developed and tested Internet lessons, lists of Internet sites and ideas for using them, ideas for using Distance Learning as enrichment for students to participate in educational experiences at home, and access to a listing of quality interactive CD-ROMs for use in the classroom. This is just a partial list of resources that should be made available to teachers. It is unnecessary and futile for teachers to try to come up with all of this integration on their own. It is also important to provide time for teachers to observe in classrooms where technology is successfully and seamlessly integrated in everyday educational activities. Guidelines for leading teachers to technology, recommended by Jamie McKenzie are as follows:

1. **Clarify the bottom line: gains in student performance**.
    a. Will work result in higher test scores?
    b. Is there evidence of gains?
    c. What is the measurable resluts?

2. **Deliver a complete package.**
    a. Teachers expect tested, refined, and perfected packages
    b. Offer learning models such as WebQuest http://edweb.sdsu.edu/webquest/webquest.html

3. **Eliminate risk and surprise.**
    a. Supply experiences with little risk. (Reluctants do not appreciate surprises and disappointments especially when they happen during class time).

4. **Speak their language.**
    a. Don't imply that everything from the past is bad.
    b. Don't imply that all technology-rich experience is good.
    c. Reluctants view rhetoric like "constructivist learning" and "student centered classrooms" with suspicion.

5. **Offer continual support.**
   a. On-going support is more important than training.
   b. There is an emotional dimension of this challenge. They need someone by there side when things go wrong.

6. **Emphasize teams.**
   a. Gains can be made when teachers work in small groups of mixed ability.
   b. Reluctants are often won over by impressive discoveries realized while exploring with peers.

7. **Find out what turns them on.**
   a. Teachers "by in" when their personal passions and interests are at stake.
   b. Too little time is spent finding out what turns people on to new learning tools.
   c. Wise districts will periodically ask teachers what is important to them.
      i. Example: "Technology in my Life Survey" – http://fromnowon.org/techlife.html

8. **Provide rewards and incentives.**
   a. Too little attention is paid to motivation.
   b. Teachers are expected to donate too much of their own time learning new tools.
   c. Teachers deserve full compensation and plenty of recognition.

9. **Don't rely on pioneers alone to plan for reluctants.**
   a. Pioneers seldom sympathize with or understand the reluctant's issues.
   b. Pioneers have different needs and far more tolerance for frustration.
   c. Pioneers find it difficult to design professional development for reluctants that work.

Technology is addressing the needs of classrooms that are moving from teacher-led to student-initiated activities, from individual to cooperative learning, from strict grade and subject boundaries to interdisciplinary work that might involve children of various ages and abilities. Technology allows learning to take place irregardless of distance or time constraints. Technology doesn't merely respond to changes in education; it creates changes of its own, influencing the roles of teachers, and the scheduling and makeup of classes. The Internet, providing distance education, won't fulfill its classroom potential without an educator to facilitate learning and integration. With patience, understanding and support, the reluctant technology user can be lead to the "sea of technology," and gently persuaded to "swim" in it's depths.

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